

REMARKS

Reexamination and reconsideration of this application is requested. Claims 1, 6, 9, and 14 have been amended, Claims 17-24 have been canceled, and new claims 25-32 have been added. After this Response, Claims 1-4, 6-12, 14-16, and 25-32 are pending in this application. No new matter was added.

The Applicants would like to note that new independent claim 25 corresponds to canceled independent claim 17 and includes language conforming to amended independent claims 1 and 9. Claims 26-30 depend from new independent claim 25 and conform to claims 2-4, and 6. New independent claim 31 corresponds to canceled independent claim 23 and includes language conforming to amended independent claims 1 and 9. New independent claim 32 corresponds to canceled independent claim 24 and includes language conforming to amended independent claims 1 and 9. No New matter was added

Rejections under 35 U.S.C. 112

The Examiner rejected claims 1-4, 6-12, and 14-24, under 35 U.S.C. § 112, first paragraph stating that the independent claims 1, 9, 17, and 23-24 recite "receiving, from a user, a desired end state associated with an autonomic computing system and a set of resource relationships associated with a set of resources for accomplishing the desired end state", "for achieving a user-defined desired end state associated with the autonomic computing system based on a set of resource relationships received from a user" and "based on the set of resource relationships received from the user and the implicit relationships that have been discovered".

The Examiner states that these elements are not specifically pointed out in the specification by the applicant and that there is not sufficient support on these limitations.

The Applicants have canceled claims 17-24 so the rejection of these claims under 35 U.S.C. § 112, first paragraph is rendered moot.

The Applicants have amended independent claims 1 and 9, and added new independent claims 25, 31, and 32. These independent claims now similarly recite:

receiving, from a user, a desired end state associated with an autonomic computing system and a set of resource relationships associated with a set of resources for accomplishing the desired end state, wherein the desired end state indicates an operational state associated with a component to be achieved by the autonomic computing system by utilizing one or more resources in the set of resources without violating relationship specifications associated with the set of resources, and wherein the set of resource relationships received from the user only specify relationships associated with a top-most level set of resources in the set of resources, wherein the availability of one or more of the top-most level set of resources is dependent on the availability of one or more resources of a lower level set of resources in a reverse hierarchy of dependencies from top-most level to lowest level set of resources...

The amended language further clarifies “a desired end state”. Support for “receiving, from a user, a desired end state associated with an autonomic computing system and a set of resource relationships associated with a set of resources for accomplishing the desired end state” can be found in the U.S. Pre-Grant Publication of the present application at, for example, FIG. 6 and paragraphs [0030], [0031], [0032], [0033], [0044], [0046], [0071]. No new matter was added.

Support for wherein the desired end state indicates an operational state associated with a component to be achieved by the autonomic computing system by utilizing one or more resources in the set of resources without violating relationship specifications associated with the set of resources, and wherein the set of resource relationships received from the user only specify relationships associated with a top-most level set of resources in the set of resources, wherein the availability of one or more of the top-most level set of resources is dependent on the availability of one or more resources of a lower level set of resources in a reverse hierarchy of dependencies from top-most level to lowest level set of resources...” can be found in the U.S. Pre-Grant Publication of the present application at, for example, Abstract and paragraphs [0032], [0033], [0034], [0043], [0046], [0047] [0071]. No new matter was added.

The claim language cited by the Examiner: "for achieving a user-defined desired end state associated with the autonomic computing system based on a set of resource relationships received from a user" and "based on the set of resource relationships received from the user and the implicit relationships that have been discovered" has been amended to more clearly recite "for achieving the desired end state associated with the autonomic computing system, wherein the policy definitions are determined based on the set of resource relationships received from the user and the implicit relationships that have been discovered". Support for the amended claim language (and original claim language) can be found in the U.S. Pre-Grant Publication of the present application at, for example, Abstract and paragraphs [0030], [0031], [0043], [0044], and [0050]. No new matter was added.

With respect to dependent claims 6 and 14, the Examiner states that the language of "real-time harvesting ..." is not found in applicant's original specification or claim language. The Applicants direct the Examiner to the U.S. Pre-Grant Publication of the present application at, for example, paragraphs [0056] and [0057], which state:

If resources are dynamically discovered as new to the system - either because they are newly defined or additional machines have been added, the process will follow path B, and the new resources, at step 1012, are filtered through the select string, at step 1008, (if one was specified), and added as required at step 1010.

The reverse is also true. If resources are removed from the system, the process follows branch C, and the discovered resource deletion, at step 1014, is checked against the equivalency set, at step 1016. If it is determined to be in an equivalency, any such resource defined in an equivalency will be removed from the equivalency at step 1018.

It should be noted that term "real-time harvesting" and other terms used in the amended claim language discussed above may not be *ipsis verbis* (not in the identical words) in the specification. However, the Examiner is respectively reminded that any terms not *ipsis verbis* are sufficiently described in the U.S. Pre-Grant Publication of the present application [0030],

[0031], [0032], [0033], [0044], [0046], [0050], [0056], [0057], and [0071].¹

Therefore, the Applicants believe Specification includes the requisite support for independent claims 1, 9, 25, 31, and 32 and dependent claims 2-4, 6-8, 10-12, 14-16, and 26-30, as required by 35 U.S.C. § 112, first paragraph. Accordingly, the Applicants respectfully suggest that this rejection be withdrawn.

Rejections under 35 U.S.C. 102

The Examiner rejected claims 1-4, 6-12, and 14-24 under 35 U.S.C. § 102(b) as being anticipated by Wolff (U.S. Patent No. 6, 067,545).

The Applicants would like to first address the Examiner's statement that independent claims 17 and 24 are of the same scope as independent claims 1 and 6 and are rejected for the same reasons. However, independent claims 17 and 24 were of a different scope than independent claims 1 and 6. For example, independent claims 17 and 24, now canceled, included "and providing, based on the policy definitions, in the memory a representation of a system-wide graph of available actions corresponding with the at least one resource in the autonomic computing system". This claim element was not recited in independent claims 1 and 6 prior to the present amendment. Further, nowhere does Wolff teach or suggest "providing, based on the policy definitions, in the memory a representation of a system-wide graph of available actions corresponding with the at least one resource in the autonomic computing system". Therefore, the Examiner has failed to show that Wolff teaches each and every element of the claims as required by 35 U.S.C. 102. Accordingly, the Applicants suggest that the finality of the present Office Action is improper.

¹ If, on the other hand, the specification contains a description of the claimed invention, albeit not in *ipsis verbis* (in the identical words), then the examiner or Board, in order to meet the burden of proof, must provide reasons why one of ordinary skill in the art would not consider the description sufficient. See *In re Alton* (Fed. Cir 1996) (Emphasis Added). See also *Fujikawa v. Wattanasin* (Fed. Cir. 1996), *ipsis verbis*, "s the Board recognized, however, *ipsis verbis* disclosure is not necessary to satisfy the written description requirement of section 112. Instead, the disclosure need only reasonably convey to persons skilled in the art that the inventor had possession of the subject matter in question. *In re Edwards*, 568 F.2d 1349, 135152, 196 USPQ 465, 467 (CCPA 1978). See MPEP 2163 subsection II 3 (a), second to last paragraph.

The Applicants would like to now address the Examiner's response to the previously presented arguments on beginning on page 8 of the Office Action. The Examiner states on page 9 of the Office Action that:

Applicant's broad terms of specifying "end state", determining and achieving "desired end state" in a cluster computing environment are abstraction of legacy "load specification", e.g. I/O request on resources, defining configuration database, and achieving load balancing configuration policy in a cluster file system nodes as per Wolff. Examiner does not see any specific difference in term of functionalities claimed by applicant from the recited functionalities of Wolff.

The Examiner goes on to state on page 10 of the Office Action:

As it is well known in the art of network management system, resource requests addressed to a network system is load balanced based upon the resource requests and network system resources distribution and availability as per Wolff's disclosure that is read upon applicant's claimed invention

The Applicants respectfully disagree with the Examiner's assertions and interpretations of the term "end state" and with the comparison of a "desired end state" to I/O requests. Even a broad reading of the claims does not support an interpretation of "desired end state" analogous to I/O request, nor does a broad reading of the claims as a whole support an interpretation of the claims being directed to load balancing. The presently claimed invention is not balancing loads across nodes, but is programmatically determining the state of each resource available and their relationships to achieve an operational state (i.e. desired end state) of a component specified in the autonomic computing system such as an application and how to programmatically achieve the operational state. For example, while Wolff is merely balancing loads across nodes that are already on-line, the presently claimed invention can instruct a resource to go off-line and another resource to come on-line in a programmatic way so that the desired end state such as an operational state of the component can be achieved. As can be seen, the teachings of Wolff are completely irrelevant to the presently claimed invention. The differences between Wolff and the presently claimed invention are evident in amended language of independent claims 1 and 6 and new claims 25, 31, and 32.

Turning now to the Examiner's rejection under 35 U.S.C. §, the Examiner on page 4 of the present Office Action states that Wolff teaches:

a method comprising: receiving, from a user, a desired end state associated with an autonomic computing system and a set of resource relationships associated with a set of resources for accomplishing the desired end state

The Examiner cites Wolff's teachings of receiving I/O requests from a user and functional relationships of database, resource, node, and other components of Wolff's system in support thereof. However, the Applicants have amended independent claims 1 and 6 and added new claims 25, 31, and 32 to more clearly recite:

receiving, from a user, a desired end state associated with an autonomic computing system and a set of resource relationships associated with a set of resources for accomplishing the desired end state, wherein the desired end state indicates an operational state associated with a component to be achieved by the autonomic computing system by utilizing one or more resources in the set of resources without violating relationship specifications associated with the set of resources, and wherein the set of resource relationships received from the user only specify relationships associated with a top-most level set of resources in the set of resources, wherein the availability of one or more of the top-most level set of resources is dependent on the availability of one or more resources of a lower level set of resources in a reverse hierarchy of dependencies from top-most level to lowest level set of resources

Support for this amendment can be found in the U.S. Pre-Grant Publication of the present application, for example, at the Abstract, FIG. 6, and paragraphs [0030], [0031], [0032], [0033], [0044], [0046], [0050], [0056], [0057], and [0071]. No new matter was added.

Nowhere does Wolf teach "wherein the desired end state indicates an operational state associated with a component to be achieved by the autonomic computing system by utilizing one or more resources in the set of resources without violating relationship specifications associated with the set of resources". In fact Wolff merely teaches receiving an I/O request as pointed out by the Examiner. Receiving an I/O request is completely irrelevant to receiving a desired end state that "indicates an operational state associated with a component to be achieved by the autonomic computing system by utilizing one or more resources in the set of resources without violating relationship specifications

associated with the set of resources". Accordingly, the presently claimed invention distinguishes over Wolff for at least these reasons.

Furthermore, Wolff is completely silent on "wherein the set of resource relationships received from the user only specify relationships associated with a top-most level set of resources in the set of resources, wherein the availability of one or more of the top-most level set of resources is dependent on the availability of one or more resources of a lower level set of resources in a reverse hierarchy of dependencies from top-most level to lowest level set of resources". Wolff does not mention anything regarding the user specifying a top-most level set of resources in the set of resources that are to be used by an autonomic system for achieving the operational state of a component indicated by the desired end state. Even Further, Wolff is completely silent on the top-most level of resources being dependent on the availability of a lower set of resources. Accordingly, the presently claimed invention distinguishes over Wolff for at least these reasons as well.

The Examiner on page 4 goes on to state that Wolff teaches:

discovering a set of implicit relationships associated with at least the set of resources

and states that Wolff's teaching of a named driver that maps network name space resources teaches the above claim element.

However, the Applicants have amended independent claims 1 and 6 and added new claims 25, 31, and 32 to more clearly recite:

discovering a set of implicit relationships associated with at least the set of resources, wherein the set of implicit relationships at least indicate one or more of a set of resource dependencies for at least one resource in the set of resources and location requirements for at least one resource in the set of resources, and wherein the set of implicit relationships are discovered automatically without the user explicitly specifying the implicit relationships, wherein the set of implicit relationships are relationships associated from the top-most level set of resources to a lower level set of resources in the set of resources

Support for this amendment can be found in the U.S. Pre-Grant Publication of the present application, for example, at the Abstract, FIG. 6, and paragraphs [0009], [0031], [0043], [0047], [0048], [0049], [0050]. No new matter was added.

Wolff is completely silent on wherein the set of implicit relationships at least indicate one or more of a set of resource dependencies for at least one resource in the set of resources and location requirements for at least one resource in the set of resources. The named driver of Wolff is not concerned with resource dependencies or location requirements for resources. Even further, Wolff is completely silent on the “implicit relationships are discovered automatically without the user explicitly specifying the implicit relationships” and “the set of implicit relationships are relationships associated from the top-most level set of resources to a lower level set of resources in the set of resources”. This last portion of the claim element allows the user to only specify relationships associated with a top-most level of resources and the autonomic system can then automatically determine the lower level relationships and dependencies associated with the resources at the top-most level. Nowhere does Wolff teach this. Accordingly, the presently claimed invention distinguishes over Wolff for at least these reasons as well.

The Examiner further states on page 4 of the Office Action that Wolff teaches:

determining, in response to the receiving, policy definitions for achieving the desired end state associated with the autonomic computing system based on the set of resource relationships received from the user and the implicit relationships that have been discovered

The Examiner supports this assertion by stating Wolff teaches “column 49, lines 54-65: command control for get/set configuration database; column 6, lines 38-42: looks up configuration database and direct I/O request; column 28, lines 11-15: configuration policy per configuration database” and “column 2, lines 37-41: pathway between resources; column 12, lines 55-67: resource and connection information”.

However, the Applicants have amended independent claims 1 and 6 and added new claims 25, 31, and 32 to more clearly recite:

determining, in response to the receiving, policy definitions associated with the set of resources for achieving the desired end state

associated with the autonomic computing system, wherein the policy definitions are determined based on the set of resource relationships received from the user and the implicit relationships that have been discovered, and wherein the policy definitions define at least one of operational policies indicating how to operate the set of resources and selection policies indicating how to select resources in the set of resources to achieve the desired end state;

Support for this amendment can be found in the U.S. Pre-Grant Publication of the present application, for example, at the Abstract and paragraphs [0030], [0031], [0043], [0044], and [0050]. No new matter was added.

The teachings of Wolf cited by the Examiner are completely silent and irrelevant to “policy definitions associated with the set of resources for achieving the desired end state associated with the autonomic computing system” where the desired end state indicates an operational state of a component of the autonomic system.

Furthermore, the teachings of Wolf cited by the Examiner are also completely silent and irrelevant to “wherein the policy definitions are determined based on the set of resource relationships received from the user and the implicit relationships that have been discovered”. Nowhere does Wolff teach that resource relationships received from the user and implicit relationships that have been determined are used to determine policy definitions. Also, Wolff is not teaching a path connection between resources as asserted by the Examiner, but a pathway between a node and a resource. Wolff makes a distinction between a node and a resource, and therefore, a node in Wolff is not a resource as asserted by the Examiner. See Wolff in general and at column 12, lines 55-67. Even further, Wolff is completely silent on “wherein the policy definitions define at least one of operational policies indicating how to operate the set of resources and selection policies indicating how to select resources in the set of resources to achieve the desired end state”. Wolff does not teach operational policies associated with resources nor does Wolff teach that these operational policies indicate how to select resources to achieve the desired end state indication an operational state of a component. Wolff merely balances a load across nodes. Accordingly, the presently claimed invention distinguishes over Wolff for at least these reasons as well.

The Applicants have amended independent claims 1 and 6 and added new claims 25, 31, and 32 to more clearly recite:

generating a system-wide directed graph, based on at least the set of resource relationships received from the user, the implicit relationships that have been discovered, and the policy definitions that have been determined that specifies a set of interrelations between the set of resources

Support for this amendment can be found in the U.S. Pre-Grant Publication of the present application, for example, at FIG. 6 and paragraphs [0034], [0043], and [0050]. No new matter was added.

Wolff is clearly silent on “generating a system-wide directed graph, based on at least the set of resource relationships received from the user, the implicit relationships that have been discovered, and the policy definitions that have been determined that specifies a set of interrelations between the set of resources”. This graph allows the autonomic system to, for example, determine what resources depends upon what, which resources can be used to support other resources, what is required to start after or before other resources, how the various parts relate so that a failure anywhere along the chain can be handled so that ordering of start and stop operations can be done correctly, and determine a set of actions to take with respect to the resources for achieving the desired end state. Accordingly, the presently claimed invention distinguishes over Wolff for at least these reasons as well.

The Examiner goes on to state on page 5 of the Office Action that Wolff teaches:

monitoring applicable resources for status information

because Wolff discloses “column 11, lines 40-57: load-balance monitor; column 24, lines 31-50: load-balance monitor”.

However, the Applicants have amended independent claims 1 and 6 and added new claims 25, 31, and 32 to more clearly recite:

monitoring each resource in the set of resources for status information associated with each resource, wherein the status information indicates a resource associated with the status information has achieved a desired end state associated with the resource, wherein the desired end state of the resource indicates at least an operational state of the resource to be achieved by the autonomic computing system in order to achieve the desired end state of the autonomic computing system;

Support for this amendment can be found in the U.S. Pre-Grant Publication of the present application, for example, at Abstract., FIG. 4, FIG. 6, and FIG. 13, and paragraphs [0034], [0044], [0050], [0071], [0072], [0073], [0074], [0075]. No new matter was added.

Nowhere does Wolff teach or suggest desired end states associated with a resource or that the desired end state of a resource indicates one or more operational states of the resource that is to be achieved by the autonomic system so that the desired end state of the autonomic system. Furthermore, the load-balancing teachings of Wolff given by the Examiner merely teach that the nodes are monitored for I/O utilization. As discussed above, Wolff distinguishes nodes from resources, therefore monitoring a node is not monitoring a resource (at least with respect to Wolff). Accordingly, the presently claimed invention distinguishes over Wolff for at least these reasons as well.

The Examiner further states on page 5 of the Office Action that Wolff teaches:

determining if the autonomic computing system is at the desired end state;
and dynamically modifying resource states, by sending an instruction for
at least one resource to perform an available action based on the policy
definitions, in response to determining the autonomic computing system is
not at the desired end state

The Examiner cites to “column 11, lines 40-53: determine if the current I/O utilization has exceeded the configured load-balance utilization threshold” and “column 13, lines 44-54: receiving a command to load-balance the aware-client from a node, redirect future I/O” of Wolff in support thereof.

However, the Applicants have amended independent claims 1 and 6 and added new claims 25, 31, and 32 to more clearly recite:

determining, based on the monitoring, if the autonomic computing system is at the desired end state, wherein the autonomic computing system is at the desired end state if each resource in the set of resources being utilized by the autonomic computing system to achieve the desired end state has achieved their own desired end states; and

dynamically modifying resource states, in response to determining the autonomic computing system is not at the desired end state, by sending an instruction for at least one resource to perform an available action based on the policy definitions and the system-wide directed graph, wherein the available action is at least one of

come on-line,

go off-line,

reset, and

combination thereof,

and wherein the at least one resource is at least one of a resource in the set of resources and a new resource identified in the system-wide directed graph.

Support for this amendment can be found in the U.S. Pre-Grant Publication of the present application, for example, at FIG. 6 and paragraphs [0034], [0043], [0044], [0050], [0071], [0072], [0073], [0074], [0075]. No new matter was added.

As discussed above, Wolff merely teaches load balancing across nodes already on-line. Wolff then notifies aware clients to redirect I/O requests to another node that is already on-line when I/O utilization at a particular node is above a threshold. This does not teach or suggest “wherein the autonomic computing system is at the desired end state if each resource in the set of resources being utilized by the autonomic computing system to achieve the desired end state has achieved their own desired end states”. First of all, Wolff does not teach or suggest using resources from the set of resources to achieve the desired end state, which indicates an operational state to be achieved for a component of the system. Wolff especially does not teach or suggest, determining if these resources being used to achieve the desired end state have achieved their own desired end state, which indicates an operational state to be achieved for each resource so that the end state of the system can be achieved. Accordingly, the presently claimed invention distinguishes over Wolff for at least these reasons as well.

Wolff further does not teach dynamically modifying the resource states by sending an instruction to the resources to perform an available action based on the policy definitions and the system-wide directed graph. As discussed above, Wolff is completely silent on the system-wide directed graph. Furthermore, the Examiner's citation of "column 13, lines 44-54: receiving a command to load-balance the aware-client from a node, redirect future I/O" shows that Wolff teaches notifying an aware client to direct I/O requests to another node. As discussed above, Wolff distinguishes a node from a resource. Wolff also distinguishes a client from a node and from a resource. Therefore, Wolff is not instructing a resource, as recited by the presently claimed invention, but a client system. Wolff also does not teach that the resource is instructed to come on-line, go off-line, reset, or a combination thereof. A client is merely directed to another node. Wolff further does not teach that "the at least one resource is at least one of a resource in the set of resources and a new resource identified in the system-wide directed graph". Accordingly, the presently claimed invention distinguishes over Wolff for at least these reasons as well.

The Applicants respectfully remind the Examiner that a proper rejection under 35 U.S.C. § 102(b) requires that a single reference teach (i.e., identically describe) each and every element of the rejected claims, which Wolff clearly does not do.² Accordingly, the present invention distinguishes over Wolff for at least this reason as well.

Therefore, in view of the foregoing remarks, Applicants believe that the rejection of Claims 1-4, 6-12, and 14-24 under 35 U.S.C. § 102(b) has been overcome. Claims 2-8, 7-8, 10-12, 14-16, and 26-30, depend from claims 1, 9, and 25, respectively. Since dependent claims include all of the limitations of their independent claim, claims 2-8, 7-8, 10-12, 14-16, and 26-30 also recite in allowable form. Accordingly, the Applicants request that the Examiner withdraw the rejection and allow Claims 1-4, 6-12, and 14-16, and 25-32.

Prior Art Made Of Record But Not Relied Upon

² See MPEP §2131 (Emphasis Added) "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). "The identical invention must be shown in as complete detail as is contained in the ... claim."

The Applicants have reviewed the references made of record but not relied upon and respectfully submit that each of these references either alone, or in any combination, or in any combination with Wolff, do not teach or suggest the presently claimed invention.

Conclusion

The foregoing is submitted as a full and complete response to the Official Action mailed April 3, 2008, and it is suggested that Claims 1-4, 6-12, and 14-16, and 25-32 are in condition for allowance. Reconsideration of the rejection is requested. Allowance of Claims 1-4, 6-12, and 14-16, and 25-32. is earnestly solicited.

No amendment made was related to the statutory requirements of patentability unless expressly stated herein. No amendment made was for the purpose of narrowing the scope of any claim, unless Applicant has argued herein that such amendment was made to distinguish over a particular reference or combination of references.

Applicants acknowledge the continuing duty of candor and good faith to disclose information known to be material to the examination of this application. In accordance with 37 CFR § 1.56, all such information is dutifully made of record. The foreseeable equivalents of any territory surrendered by amendment are limited to the territory taught by the information of record. No other territory afforded by the doctrine of equivalents is knowingly surrendered and everything else is unforeseeable at the time of this Response by the Applicants and attorneys.

If the Examiner believes that there are any informalities that can be corrected by Examiner's amendment, or that in any way it would help expedite the prosecution of the patent application, a telephone call to the undersigned at (561) 989-9811 is respectfully solicited.

The present application, after entry of this Response, comprises twenty-two (22) claims, including five (5) independent claims. Applicants have previously paid for twenty-four (24)

claims including five (5) independent claims. Applicants, therefore, believe that an additional fee for claims amendment is currently not due.

The Commissioner is hereby authorized to charge any fees that may be required or credit any overpayment to Deposit Account **50-1556**

In view of the preceding discussion, it is submitted that the claims are in condition for allowance. Reconsideration and re-examination is requested.

Respectfully submitted,

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